Module 2

Designing a Database

Materials Required for Module 2

- *Microsoft Access User's Guide*

Note:
A computer is not required to complete this module.

Objectives for Module 2

Lesson 1 - Relational Database Design

Upon completion of this lesson, you will be able to:

- Define the terms Primary Key, Foreign Key, and Relationship.
- Identify One-to-Many, Many-to-Many, and One-to-One relationships.
- Identify the tables, fields, and relationships that are needed, given the needs of a database user.

Lesson 1

Relational Database Design

Reading Assignment

r *Microsoft Access User's Guide*
Chapter One: *Designing a Database*

As You Read

r How important is good database design? Consider a telephone company that stores its customer information according to telephone numbers. If you installed a second line for a fax machine, how many bills would you receive each month?

How many records would need to be modified if you moved to a new address?

Exercises

1) What is information and how does it differ from data?

2) What is a relationship in a database?

3) Describe a One-to-Many relationship.
   Example: Employees <-> Orders

4) Describe a Many-to-Many relationship.
   Example: Classes <-> Students

5) Describe a One-to-One relationship.
   Example: Products <-> Descriptions

6) Why should data like a suppliers' address or the current tax rate appear only once in your database?

7) When should you include calculated or derived data in your tables?

8) If you were tracking each personal phone call made while at work, would the date of the call make a good primary key?

9) If you were tracking the time that you arrived to work each morning would the date make a good primary key?

   Points to Ponder
   Let's go back to the telephone company example discussed at the beginning of this module. What would be the drawbacks to tracking customers and telephone numbers by addresses?

On-Your-Own Lab

Throughout this self-study you will be creating your own Address Book database in Microsoft Access. Each time you learn how to do something new in this course you will practice what you have learned by adding features to your own database.

Keep in mind that there is not one "right" way to implement a feature in a relational database. You may find that you will include fields or tables that no other participant feels are necessary. During the instructor-led labs that follow each module, you will compare your design and implementation with those of other participants so that you have a chance to discuss the benefits and limitations of different designs; just as you will discuss different options with customers.

You may personalize your database so that it suits your needs. However, in order to complete future exercises you must include the tables, fields, relationships, and forms described in the lab instructions. At the end of each lab you will be given an example database which meets these requirements. You may either use it for the following labs or add to your design.

1. List ten questions that you would like to be able to answer by querying your database:

Hint: 1) Who in your Address Book has a birthday in February ?

Hint: 2) How many cats, dogs, and birds does each family have ?

Hint: 3) How many ski? (You want to invite them to watch a slide show of your last trip to Whistler.)

4)

5)

6)

7)

8)

9)

10)

On-Your-Own Lab

2. List the tables that you need in order to answer the questions above. Fill in the spaces provided below:

Hint: Although you could implement this database with as few as one table, four are recommended. In order to answer the first three questions in step one you need to have a table for the people you want to track, a table for their dependents, one for their hobbies, and one to track their pets.

3. Each of the subjects you listed above will be a table in your database. Under each subject list the information you want in each table.

4. Now that you have decided on what data to put in each table, you need to determine the relationships that will help you to obtain the information to answer your ten questions. Draw a line from the Primary Key to the Foreign Key for each relationship.

5. Now that you have a design, check to make sure that it meets your needs. Can you answer each of your ten questions by looking at the data in your tables?

The PSS Challenge

In the As You Read and Points To Ponders sections of this module you were asked to consider the drawbacks of tracking telephone customers by their name, household, or phone number. By applying what you have read in chapter one of the User's Guide, design a solution that will allow the telephone company to obtain the following information: the names of all customers it has done business with, the addresses of each household it has done business with, all phone numbers the company can assign, and a list of the phones numbers that are currently assigned to a household that includes the name of the person(s) responsible for paying the bill for that number.

Instructor Led Module Review